ON THE CORRECTION
AND USE OF CHARTS

ON THE

CORRECTION AND USE

OF THE

ADMIRALTY CHARTS, SAILING DIRECTIONS AND LIGHT LISTS.

WITH AN

ARTICLE ON SMALL SCALE CHARTS.

London:
PUBLISHED BY
J. D. POTTER, 145, MINORIES, E.C.
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(Gratis)

PREFACE.

The Notes "On the Correction of Charts," contained in this pamphlet are intended for the information of Masters and Officers of the British and Foreign Mercantile Marine, and Yachtsmen, and are extracted from paragraphs in "Notes bearing on the Navigation of H.M. Ships" (published by the Admiralty), and from Section VIII. of "Lloyds' Calendar" (published with the approval of the Committee of Lloyds').

LONDON, 1914.

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ON THE CORRECTION OF THE ADMIRALTY CHARTS, SAILING DIRECTIONS, AND LIGHT LISTS.

THERE are three descriptions of publications as guides to navigation—the Charts, the Sailing Directions, and the Light Lists—which are all affected by the continual changes and alterations that take place.

Of these the Charts are the most readily kept correct, but the Light Lists should also be noted for the recent alterations. The Sailing Directions, however, cannot, from their nature, be kept up-to-date, and *in all cases where they differ from charts, the charts must be taken as the guide.*

ADMIRALTY CHARTS: When issued from the Admiralty Chart Agent,* the charts contain the latest information received at the Hydrographic Department, and the date to which they are corrected is noted in the centre or left hand lower corner of each copy.

Once out of his hands there is no guarantee that further corrections are made before sale by local firms at different ports, and purchasers should obtain some assurance that the charts are correct to date.

All small but important corrections affecting navigation, that can be made by hand, are notified by Notices to Mariners, (see sections III. and IV. of the weekly Admiralty Notices to Mariners) and are at once placed on the charts to which they refer.

Large corrections, (now termed "New Editions,") that cannot be conveniently thus made are put upon the chart plates, and fresh copies are issued to the Agent for immediate distribution (Section VI. of the weekly Admiralty Notices to Mariners. (See page 11).

The dates on which these New Editions are made are noted on the chart plates in the middle of the lower edge; those of the smaller corrections at the left-hand lower corner.

In all cases of quotations of charts, these dates of corrections should be given, as well as the number of the chart; in order that it may be known which edition of the chart is referred to.

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* J. D. Potter, 145 Minories, London, E.C.

It should be remembered that in addition to the large and small corrections here mentioned, the Chart plates are being constantly corrected for numerous details which do not affect safe navigation. For these corrections the Charts are not dated, nor are any Notices to Mariners issued, and it follows that two Charts, bearing the same dates of "New Editions" and "Small Corrections," may not therefore exactly agree in all respects.

Information as to New Charts published will be found in Section VI. of the weekly Admiralty Notices to Mariners. (See page 11).

THE ADMIRALTY SAILING DIRECTIONS are revised and new editions of these issued as frequently as is practicable, and as their importance demands. They are not corrected before issue, but on page iii. in the "Advertisement" to each volume will be found the number of the last Notice to Mariners used in its revision; and the numbers of the subsequent Notices affecting it between going to press are given in the first Notice to Mariners relating to that part of the world after date of publication.

About February of each year, a summary of the information affecting each volume of Sailing Directions, which has been published during the preceeding year in Notices to Mariners, is issued in a separate publication (commencing January, 1908). If a Supplement or Revised Supplement has been issued during the year, this summary will only include Notices to Mariners issued since the date of such Supplement; if one is in preparation at the end of the year, no summary will be issued. New editions of Sailing Directions, Supplements, &c., are advertised in Section VII. of the weekly Admiralty Notices to Mariners. (See page 12).

THE ADMIRALTY LIGHT LISTS are annually published in the early part of the year (about February), corrected to the 31st December of the previous year.

Subsequent alterations to the Light Lists can be obtained by referring to Section VIII. of the weekly Admiralty Notices to Mariners. (See page 13).

The Light Lists should always be consulted as to the details of a light, as the description in the Sailing Directions may be obsolete in consequence of changes made since publication.

INFORMATION FOR THE CORRECTION OF BRITISH ADMIRALTY CHARTS & HYDROGRAPHIC PUBLICATIONS. Mariners and others are invited in the interests of navigation to forward to the Hydrographer, Admiralty, London, S.W., any information that may come under their notice, which would be useful for the correction of the Charts and other Hydrographic Publications issued by the British Admiralty; *early* advice as to newly discovered dangers, the establishment of, or changes in, any aids to navigation is specially requested.

Copies of a form (H. 102) on which to render information can be obtained *gratis* from the Admiralty Chart Agent, J. D. POTTER, 145, MINORIES, LONDON, E.C., or of any of the Sub-Agents in Great Britain and Abroad, a list of whom will be found at end of all books published by the Hydrographic Department.

ADMIRALTY NOTICES TO MARINERS are issued weekly, and can be obtained, free of charge, from 145, MINORIES, LONDON, E.C.

Some Specimen Pages from these Notices are reproduced on pages 10—13.

The official Catalogue of Admiralty Charts and Sailing Directions is issued annually in March. This is a volume of 330 pages with 24 Index Charts, and can be obtained, free of charge, from the Chart Agency, address as above, or from any of the Sub-Agences in the Home and Foreign Ports.

Specimen Page.

ADMIRALTY

NOTICES TO MARINERS.

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I. Index to Notices to Mariners.
II. Notices to Mariners.
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IV. Charts temporarily affected by ,, ,,
V. Sailing Directions affected by ,, ,,
VI. (*a*) New Charts. (*b*) New editions of Charts. (*c*) Charts cancelled.
VII. (*a*) New Books. (*b*) Books in the press. (*c*) Books under revision. (*d*) Books in course of preparation.
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Specimen Page.

VI.

CHARTS.

(9th to 15th November, 1913.)

(a) *New Charts.*

Page of Catalogue.	*No.*	*Scale.*		s.	d.
85	1054	m = 2·9	MADAGASCAR.—Plans in Madagascar:—Baie Ambavanibé Baies Ampanasina and Lotsoïna. Baie de Rigny (Ambavarane)	3	0

(b) *New Editions of Charts.*

Page of Catalogue.	*No.*		s.	d.
11	1895	ENGLAND, SOUTH COAST.—Dungeness to the Thames, including Dover strait	4	0
19	2397*a*	SCOTLAND, EAST COAST.—Scotland, north and east coasts, with the Orkneys and Shetland—south sheet. (Plans:—Loch Fleet. Cromarty and Inverness firths. Banff and Macduff. River Tay. Leith and Granton. Head of the Firth of Forth. Fraserburgh. Peterhead. Aberdeen. Montrose. Stonehaven. Arbroath)	3	0
51	3414	MEDITERRANEAN, FRANCE.—Approaches to Marseille). (Plan:—Port de Bouc)	3	0
110	3032	CHINA.—The Upper Yang tse kiang—sheet 6: Kwei chau fu to Chung king fu. *Plan of Chung kiang fu on this sheet erased*	3	0
149	2614	NEW ZEALAND, NORTH ISLAND.—Kaipara harbour	3	0

(c) *Charts Cancelled.*

Page of Catalogue.	*No.*				*No.*
85	1054	MADAGASCAR:—			
		Ports and anchorages in the northern portion of Madagascar:—Port Liverpool (Ambavanibé). Entrance to Port Robinson. Port Ambavarane (Port Lady Frances or Rigny bay).	cancelled by	New chart:— Plans in Madagascar:— Baie Ambavanibé, Baies Ampanasina and Lotsoïna. Baie de Rigny (Ambavarane) ...	1054
108	1994	CHINA, EAST COAST.—San mun bay and Shih phu harbour.			

Specimen Page.

VII.

BOOKS.

(25th to 31st January, 1914.)

(a) New Books.

Revised Supplement, 1913, to Alaska and Bering Sea Pilot, 1908.

List of Lights and Time Signals, 1914.

	s.	d.
Part I.—British islands	1	6
Part II.—North and Arctic seas, north of Cape Grisnez (except British islands)	2	6
Part III.—Baltic sea	2	0
Part IV.—Eastern side of North and South Atlantic oceans south of Dunkerque	1	6
Part V.—Mediterranean, Black and Red Seas	1	6
Part VI.—Indian and West Pacific oceans	2	0
Part VII.—Western side of South Atlantic ocean and East Pacific ocean	1	0
Part VIII.—Western side of North Atlantic ocean	2	6

(b) Books in the Press.

North Sea Pilot, Part III., 1914.
Baltic Pilot, Part II., 1914.
Revised Supplement, 1913, to Pacific islands, Vol. II., 1908.
Distance Tables, Vol. III., Eastern shores of the Atlantic ocean, and off-lying islands from Iceland to the Cape of Good Hope (excluding the British islands, France, and the South Coast of Spain), and the shores and islands of the Indian ocean, including the North and West Coasts of Australia.

(c) Books under Revision.

North Sea Pilot, Part II., 1905.
Supplement, 1912, to West Coast of Scotland Pilot, Part I., 1911.
Supplement, 1912, to West Coast of Scotland Pilot, Part II., 1911.
Norway Pilot, Part II., 1905.
Arctic Pilot, Vol. III., 1905.
Mediterranean Pilot, Vol. II., 1905.
Supplement, 1911, to Mediterranean Pilot, Vol. IV., 1908.
Supplement, 1911, to Black Sea Pilot, 1908.
South America Pilot, Part II., 1905.
Persian Gulf Pilot, 1908.
Japan, Korea and adjacent Seas, 1904.
Australia Directory, Vol. III., 1903.

(d) Books in course of Preparation.

Supplement to South America Pilot, Part I., 1911.
Yangtse Kiang Pilot.
Supplement to East Coast of Korea, etc., Pilot, 1913.
Distance Tables, Vol. IV., including distances between the eastern and western shores of the Atlantic ocean.

Corrections to Admiralty List of Lights, 1913.

(*19th to 25th October, 1913.*)

No.	Name.	Year established or last altered.	Position. Latitude. Longitude.	Number and colour of lights. Fog signals.	Character and period of lights.	Height in feet above high water.	Miles seen in clear weather.	Character of apparatus. C.P. in 1000.	Description of building or vessel, with approximate height in feet.	Remarks.	Notice to Mariners affecting Light List.
	PART I.										
922	ABERYSTWYTH ...	...	... ...	...	...	...	...	...	... ...	Two *red fixed* leading lights are shown when required, chiefly between 30th September and 31st March. *Amend 2nd sentence of remarks.*	1600
1189*c*	MULROY BAY AND LOUGH (U.) RAVEDY ISLAND	...	... ...	...	...	...	...	...	... ...	Visible from S. 17º W., through west, to N. 17º E. *Insert remarks.*	1605
1189*d*	FIGHAN HILL	...	... ...	...	...	...	...	...	... ...	Leading lights S. 9º W. *Insert leading line.*	

Specimen Page.

VIII.

THE USE OF
THE ADMIRALTY CHARTS AS NAVIGATIONAL AIDS, AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

ACCURACY OF A CHART.—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based and this becomes more important the larger the scale of the chart.

To estimate this, the date of the survey, which is always given in the title, is a good guide. Besides the changes that in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fulness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty Chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey except in the case of Coast sheets, which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor are made on a scale of three inches to the mile, and surveys of frequented ports, or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile.

General Coast Charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the contour line of 10 fathoms, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of six inches to the mile, vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead will not rest on them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is specially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch.

A wide berth should therefore be given to every rocky shore or patch, **and this rule should be invariably followed, viz., that instead of considering a coast to be clear unless it is shown to be foul, the contrary should be assumed.**

FATHOM LINES A CAUTION.—Except in plans of harbours that have been surveyed in detail, the five-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The ten-fathom line is, on rocky shores another warning, especially for ships of heavy draught.

Charts where no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed round, as there is no knowing how closely the spot may have been examined.

CHART ON LARGEST SCALE ALWAYS TO BE USED.—It sometimes happens that, from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive correction to coastline or soundings. This is another reason, besides the obvious one of the greater detail shown on a larger scale chart, why this largest scale chart should always be used for navigating.

CAUTION IN USING SMALL SCALE CHARTS.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile. This is particularly to be observed when coming to an anchor on a narrow ledge of convenient depth at some distance from the shore.

For the same reason bearings to objects near should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position.

GRADUATION. All Plans are now being graduated in skeleton style before publication in order to facilitate easy reference to astronomical positions; previously published plans are also graduated as opportunity offers. The graduation is, however, of necessity, often based upon imperfect information of a conflicting nature; for this reason, whenever an astronomical position is quoted other than approximate (*i.e.*, when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived.

DISTORTION OF PRINTED CHARTS. The paper on which the Admiralty charts are printed has to be damped. On drying, distortion takes place from the inequalities in the paper, which greatly varies with different qualities of paper and the amount of the original damping: but this does not affect navigation to an appreciable extent. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree, when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the probable amount of this distortion.

BUOYS. It is manifestly impossible that reliance can be placed on buoys always maintaining their exact position. Buoys should therefore be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings or angles of fixed objects on shore and not by buoys.

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* (See also article reprinted from The "Syren and Shipping," page 33.)

GAS BUOYS. The lights shown by gas buoys cannot be implicitly relied on, as, if occulting or flashing, the mechanism regulating the character and period of the light may get out of order, or the light may be altogether extinguished.

LIGHTS. Circles drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Admiralty Light Lists and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to height, at the beginning of each Light List, affords a means of ascertaining how much more or less the light is visible should the height of the bridge be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light, a very correct bearing may be afterwards obtained from the standard compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its order or candle power as given in the Admiralty Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range due to the height at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles if of any power. (See table in the Admiralty Light Lists before mentioned).

The distance from a light cannot be estimated either by its brilliancy or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip, it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

FOG SIGNALS. Sound is conveyed in a very capricious way through the atmosphere. Apart from wind, large areas of silence have been found in different directions and at different distances from the fog signal station, in some instances even when in close proximity to it. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog sometimes creeps imperceptibly towards the land, and is not observed by the people at a station until it is upon them; whereas a ship may have been for many hours in it, and approaching the land. In such a case no signal may be made. When sound has to travel against the wind, it may be thrown upwards; in such a case, a man aloft might hear it when it is inaudible on deck. Under certain conditions of the atmosphere, when the fog signal is a combination of high and low notes, one of the notes may be inaudible.

The mariner should not assume—

(*a*) That, because he fails to hear the sound, he is out of hearing distance.

(*b*) That, because he hears a fog signal faintly, he is at a great distance from it.

(*c*) That, because he hears the sound plainly, he is near it.

(*d*) That, because he does not hear it, even when in close proximity, the fog signal has ceased sounding.

(*e*) That the distance from the intensity of the sound on any one occasion, is a guide to him for any future occasion.

Taken together, these facts should induce the utmost caution in closing the land in fogs. *The lead is the only safe guide.*

Referring to signals from ship to ship for the avoidance of collision in fog, an esteemed correspondent writes as follows:—

" *The first thing that a mate on the bridge does when he hears a fog-horn is to blow his own, and he always answers the signal at once. The man on the other vessel cannot possibly hear him, because his ears are deafened by the noise of his own horn, and he is, therefore, not aware of the presence of the other vessel until it is too late, and at the subsequent* *trial he will swear, and truthfully too, that he never heard the fog-horn, although it was blown as often as his own. All officers should be warned that if they blow their horn immediately after hearing another one they will not be heard. They should wait at least half a minute before they answer a distant call, in order to allow those on board the other vessel to regain the full use of their ears.*"

TIDES AND TIDAL STREAMS. In navigating coasts where the tidal range is considerable, caution is always necessary. It should be remembered that there are generally indraughts to all bays and bights, although the general run of the stream may be parallel to the shore.

In crossing a bar or shallow flats, the diagrams on pages 314 to 321 of the Admiralty Tide Tables will be found of great assistance in calculating how much the water has risen or fallen at any hour of the tide.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can never be depended upon, and additional caution is therefore necessary.

It should also be remembered that at times the tide falls below the level of low-water ordinary springs. This always occurs on the coasts of Europe at the equinoxes, but in other parts of the world, and especially in the tropics, such periodic low tides may coincide more frequently with the solstices. Wind or high barometer may produce it at any time, and the amount varies with locality. When the moon's perigee coincides with the full or new moon the same effect is often produced.

See "Treatise on Tides," in Admiralty Tide Tables, p. xv, pars. 32 and 33, for useful information on Tidal Streams.

CURRENT ARROWS on charts only show the most usual or the mean direction of a tidal stream or current. It must never be assumed that the direction of a stream will not vary from that indicated by the arrow. In the same manner, the rate of a stream constantly varies with circumstances, and the rate given on the chart is merely the mean of those found during the survey, possibly from very few observations.

FIXING POSITION. The most accurate method of fixing a position relative to the shore is by angles between well-defined objects on the chart. All ships which are supplied with a station pointer should use this method whenever possible.

Two things are, however, necessary to its successful employment. First, that the objects be well chosen; and second, that the observer is skilful and rapid in the use of the station pointer and sextant.

For the former, reference can be had to the pamphlet* on the use of the station pointer; but the latter is only to be obtained by practice.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

It is not intended that the use of the compass to fix the ship should be given up; there are many circumstances in which it may be usefully employed, but errors more readily creep into a position so fixed.

In all cases where great accuracy of position is desired, angles should invariably be used, such as the fixing of a rock or shoal, or of additions to a chart, of fresh soundings or new buildings. In all such cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself. In the case of ordinary soundings, it is only necessary to take a third angle now and then; firstly, to check the general accuracy of the chart as above stated; secondly, to make certain that the more important soundings, such as at the end of a line, are correctly placed.

Sometimes, when only two objects are visible, a compass bearing and sextant angle may be used with advantage.

In passing near a point of land, or an island, the method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "four-point bearing," when the bearing is taken four points on the bow, and on the beam, the distance from the object at the latter position being the distance run between the times of taking the two bearings, allowing for current, gives an excellent fix for a departure, but does not ensure safety, as the point, and probably the rocks off it, are abeam before the position is obtained.

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*Published by the Admiralty and sold by J. D. Potter.

By taking the bearings of two points and four points on the bow, a very good position is obtained before the object is passed; the distance of the latter at the second position being, as before, equal to the distance run in the interval, allowing for current.

This is, however, only strictly true if the current is directly with or against the course of the ship. If a cross current has to be allowed for, the results by this method may be altogether erroneous and misleading.

The use of a danger angle in passing outlying rocks with land behind should also not be forgotten. In employing this method, however, caution is necessary, as should the chart be not accurate, *i.e.*, should the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

In fixing by the compass, it must always be remembered that two bearings only are liable to error. An absolute error may be made in either bearing observed; errors may be made in applying the deviation; or errors may creep in when laying them down to the chart. For these reasons, a third or check bearing of some other object should be taken, especially when near the shore or dangers. The coincidence of these three lines will prevent any mistakes.

Amongst astronomical methods of fixing a ship's position, attention is drawn to the great utility of Sumner's method. A Sumner line, that is, a line drawn through the position (obtained by an assumed latitude and longitude) at right angles to the bearing of the sun, as obtained from the azimuth tables, gives at times invaluable information, as the ship must be somewhere on that line provided the chronometer is correct. A deep cast of the lead at the same time may often serve to get an approximate position on the line. An early and very accurate position can be also obtained by Sumner's method, by getting a Sumner line by a bright star at daylight when the horizon is well visible, and another Sumner line by the sun when a few degrees above the horizon, or better still, by observing two or more stars at twilight. The Sumner lines thus obtained will, if the bearing of sun and star differ three points or more, give an excellent result.

CHANGE OF VARIATION OF THE COMPASS. The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when necessary, but the chart plates cannot be corrected frequently from the impossibility of making alterations too often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need serious consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English Channel about 5° in 400 miles. The variation charts (Nos. 2598, 3775, 3776, 3777) should be consulted on this head.

On certain General Charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses,* the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation Charts. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the Chart not in immediate proximity to any one of the engraved compasses.

**See* Extract from "Notice to Mariners," No. 4, of 1914—pp 23–24.

Extracted from "NOTICE TO MARINERS," No. 4, of 1914.

The introduction of TRUE bearings.

Notice is hereby given that True bearings are being gradually introduced in all Admiralty Publications.

Details of the new system are as follows:—

(*a*) On charts:

A new pattern compass is being gradually introduced which enables True Bearings to be laid off on the chart in addition to Magnetic Bearings. (*See* diagram overleaf.)

The compass consists of two graduated circles, clearly separated from each other.

The outer circle is a true compass, graduated from 0° (True North) to 360°, measured clockwise.

The inner circle is a magnetic compass, graduated in points and in degrees from 0° to 90° as heretofore.

The bearings of leading and clearing marks, etc., are given both True and Magnetic, and a note to this effect is placed in the title of the charts. (*See* overleaf.)

Example.—The bearing N. 62° W. true, with a variation of 8° Westerly, will be shown thus: 298° (*N. 54° W. Mag.*)

(*b*) In Sailing Directions:

Bearings will be given as True only, in degrees from 0° (North) to 360° measured clockwise; and a note to this effect will be given in the title page, in the Advertisement, and in the page immediately preceding page 1 of all volumes of Sailing Directions. The Variation will continue to be given on each page as at present, so that Magnetic bearings may be obtained when required.

This alteration only applies to new editions of Sailing Directions and their Supplements. In the case of Sailing Directions in which Magnetic bearings are still given, Magnetic bearings will be given in their Supplements.

(*c*) In Notices to Mariners:

All bearings are given both True and Magnetic in a similar manner to that adopted on charts.

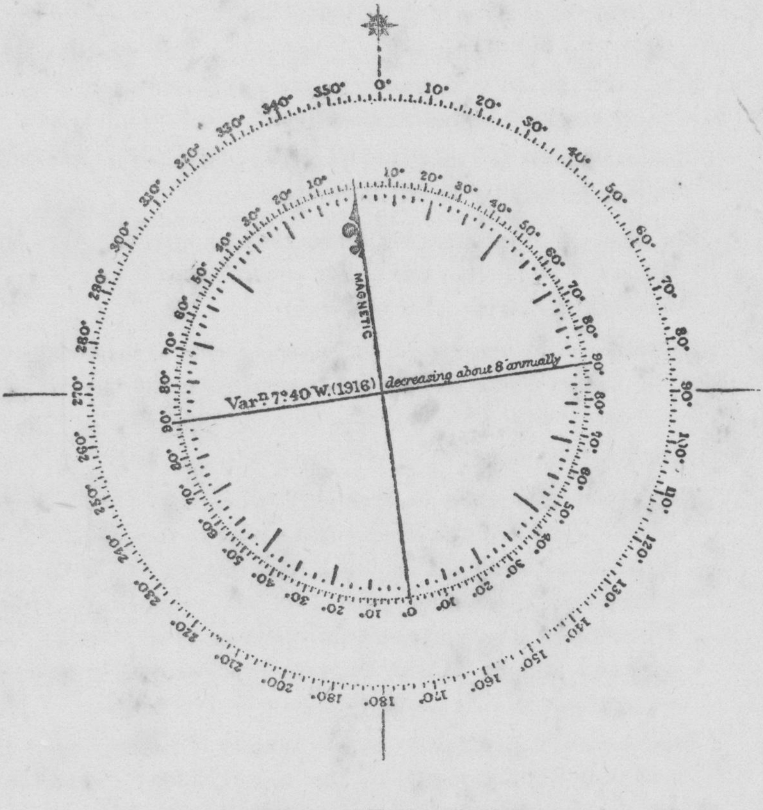
(*d*) Lists of Lights:

Bearings will be given in all Parts of the List of Lights for 1914 as True only, in degrees from 0° (North) to 360°, measured clockwise.

On each page of the List of Lights, a footnote is placed stating that all bearings are **TRUE FROM SEAWARD.**

Pattern of Compass

(adopted after June, 1911.



Addition to Title of Chart.

Bearings are given both True and Magnetic thus: 298° (N54° W. Mag.)

LOCAL MAGNETIC DISTURBANCE OF THE COMPASS ON BOARD SHIP. The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that disturbance of the compass in a ship afloat is experienced only in a few places on the globe.

Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together.

The law which has hitherto been found to hold good as regards local magnetic disturbance is, that north of the magnetic equator the north end of the compass needle is attracted towards any centre of disturbance; south of the magnetic equator it is repelled.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

In some parts of the world there are depths of water sufficient for the largest ships to navigate in safety, where the bottom is sufficiently magnetic and close enough to affect their compasses, and increased vigilance should be used when approaching those countries at night or in thick weather. The following are places known to be so affected:—

North Quarken, Gulf of Bothnia; Cape St. Francis, Labrador; Cossack, North Australia; New Ireland; Bougainville, Solomon Islands; Tumbora Volcano, Sumbawa Island, near Java; Coasts of Madagascar, especially near St. Mary's Isle; Delagoa Bay; Iceland and its adjacent waters; Odessa Bay and the shoal south of it; Isle de Los, West Coast of Africa. Other parts of the globe are suspected of similar disturbing effects.

COMPASSES.—HEELING ERROR. The attention of mariners is directed to the necessity of exercising a constant watchfulness in regard to the errors of their navigating compasses, more particularly to the heeling error, the neglect of which is doubtless a common, though often unsuspected, cause of the stranding of many vessels.

Serious changes frequently take place in the character and amount of the heeling error as the ship changes her magnetic latitude; from (1) the vertical force arising from the permanent magnetism of the ship, the error from which is greatest in high latitudes, diminishes until the Equator is reached, where it is least, and increases again in the opposite hemisphere, but still retaining the same name; (2) from vertical induction in vertical soft iron, and transverse soft iron generally (such as beams, etc.), the error from which is greatest in high latitude, diminishes until the Equator is reached, where it becomes nil, and increases again (but of an opposite name) as the vessel recedes from the Equator in the opposite hemisphere. It is difficult, therefore, to predict with any great accuracy the change that will take place—observations at every possible opportunity being the only reliable safeguard.

In the northern hemisphere, in ships built with their heads from about S.E., through N., to S.W. (the usual effect of the permanent magnetism of the ship then conspiring with that of her vertical and transverse soft iron), the north point of the compass needle, assuming the compass to be on the upper deck and on the after portion of the ship as usual, will, as a general rule, be drawn to windward or to the high side of the ship; the nearer the ship's head was to N. whilst building, the greater the error that may be expected—the effect being to throw the ship to windward of her supposed position when steering on northerly courses, and to leeward on southerly courses, the error decreasing as the Equator is approached, and small, perhaps of a contrary name, in the southern hemisphere.

In ships built with their heads from about S.E., through S., to S.W. (the usual effect of the permanent magnetism, and that of the transverse, &c., soft iron being then contrary to each other), the north end of the compass needle may be drawn to leeward, depending upon whether vertical force of the permanent magnetism or that of the induced magnetism of transverse and vertical soft iron predominates, but the error would then, as a general rule, be small in northern latitudes and large in the southern hemisphere.

It has been established as a rule, however, that in the northern hemisphere (in compasses above the upper deck) in the majority of iron ships the north point of the compass needle is drawn to windward or to the high side of the ship, the consequence being that if this is not allowed for, a ship will go to windward of her supposed position on northerly courses and to leeward on southerly courses.

The heeling error is always greatest with the ship's head at or near N. or S. by the disturbed compass, and least, or nil, with the ship's head E. or W. It is particularly important, therefore, should the vessel heel over either from the effect of the wind or the cargo, when steering in a northerly or southerly direction, that the mariner should use every precaution, and never lose an opportunity of ascertaining the errors of his compass.

The heeling error may be small or large, depending greatly upon the position of the compass—it has been known to exceed 2° for every degree of heel of the ship—and is directly proportional to the amount of heel; consequently, if the error at N. or S. for 1° of heel is known, the error for any other direction of the ship's head and amount of heel can be found by the usual methods.

The adjustment of compasses by magnets, soft iron, etc., which is for bringing the error within manageable limits and for equalizing the directive force of the needle, must only be considered approximate for the latitude in which the adjustment was made, and no opportunity should be lost of verifying the error both in port and at sea, as it is usually constantly changing from numerous causes, chief amongst which are heeling, change of latitude, change of cargo, collision, after repairs, and from the ship remaining with her head in one direction for a length of time, etc.

OIL ON ROUGH SEAS.

Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of Seamen, whose attention is called to the fact that a very small quantity of Oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, *i.e.*, waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain; as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a seaway at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be :— Hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate the leakage of the oil.

The position of these bags should vary with the circumstances, Running before the wind they should be hung on either bow—*e.g.*, from the cathead—and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying-to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat, which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

CONCISE RULES FOR REVOLVING STORMS.

1. Revolving storms are so named because the wind in these storms revolves round an area of low pressure situated in the centre. They have also local names, and are termed Hurricanes in the West Indies and South Pacific Ocean; Cyclones in the Indian Ocean, Bay of Bengal and Arabian Sea; and Typhoons in the China Sea.

2. In these storms the wind always revolves the same way in the same part of the world; that is, against the movement of the hands of a watch in the northern hemisphere, and with the hands of a watch in the southern hemisphere. The wind does not revolve in circles, but has a spiral movement, inwards towards the centre.

3. Revolving storms have also, as a general rule, a progressive movement. Within the tropics they usually move from east to west at first, and then curve towards the pole of the hemisphere in which the storm is generated, and afterwards move from west to east.

4. The track which the centre of the storm takes is called the path of the storm, and the portion of the storm-field on the right of the path is known as the right-hand semicircle and that on the left as the left-hand semicircle of the storm.

5. In the right-hand semicircle, if the observer be stationary, the wind will always shift to the right, and in the left-hand semicircle to the left. This law holds good in both hemispheres.

6. If a vessel be so situated in a storm that by running before the wind the path of the advancing storm will be crossed, this is considered to be the dangerous semicircle. This will always be the right-hand semicircle in the northern hemisphere, and the left-hand in the southern.

7. These storms are most frequent in the northern hemisphere from July to November, and in the southern hemisphere from December to May. In the Bay of Bengal and Arabian Sea they, however, occur most frequently about the time of the change of the monsoon.

8. The area over which revolving storms have been known to extend varies in diameter from 20 miles to some hundreds of miles, and their rate of movement in the West Indies averages about three hundred miles a day; in the China Sea, Bay of Bengal and Arabian

Sea about 200 miles a day; and in the Indian Ocean from 0 to 200 miles a day, the more stationary storms occurring at the beginning and end of the Hurricane season.

9. The indications of the approach of a revolving storm are;—(1) An unsteady barometer, or even a cessation in the diurnal range which is constant in settled weather; (2) a heavy swell not caused by the wind then blowing; (3) an ugly, threatening appearance of the sky.

10. In order to judge what is the best way to act if there is reason to believe a storm is approaching, the seaman requires to know (*a*) in which direction the centre of the storm is situated; (*b*) in which semicircle the ship is situated.

11. As these points cannot be determined if a vessel is moving with any speed through the water, the first proceeding should be to "stop" or "heave to," and, as it is always best to assume at first that the vessel may be in the dangerous semicircle, she should be hove to on the starboard tack in the northern hemisphere and on the port tack in the southern.

12. If an observer faces the wind, the centre of the storm will be from 12 to 8 points on his right hand in the northern hemisphere and on his left hand in the southern hemisphere; 12 points when the storm begins; about 10 points when the barometer has fallen $\frac{3}{10}$ of an inch, and about 8 points when it has fallen $\frac{6}{10}$ of an inch or upwards.

13. If the wind shifts to the right the vessel is in the right-hand semicircle; if to the left, in the left-hand semicircle; and if the wind is steady in direction but increasing in force, she is in the direct path of the storm.

14. If the seaman has reason to think that his vessel is in the direct path of the storm, he should run with the wind on the starboard quarter in the northern and on the port quarter in the southern hemisphere until the barometer has ceased falling. If she is in the right-hand semicircle in the northern hemisphere she should remain hove to on the starboard tack, but if in the southern hemisphere run with the wind on the port quarter; if she is in the left-hand semicircle in the northern hemisphere she should run with the wind on the starboard quarter, but if in the southern hemisphere remain hove to on the port tack.

15. Should a vessel not have sufficient room to run when in the least dangerous semicircle, she should heave to on the port tack in the northern and on the starboard tack in the southern hemisphere.

16. If in a harbour or at anchor, the seaman should be just as careful in watching the shifting of the wind and ascertaining the direction of the centre, as by so doing he will be able to tell on which side of the path of the storm he is situated, and be able to act according to circumstances.

17. Should the centre of a storm pass over a vessel, the wind, after blowing furiously in one direction, ceases for a time, and then blows with equal fury from the opposite direction. This makes a confused pyramidal sea, which is especially dangerous.

SMALL SCALE CHARTS.

REPRINTED (BY PERMISSION) FROM *The Syren and Shipping*, 18th June, 1902.

Small-scale charts for navigating purposes have caused the loss of many a good ship, but really such an excuse ought no longer to be accepted as a valid one under modern conditions of sea service. In large firms charts are not only supplied by the shipowner, but also kept posted up to date at his expense. Yet, just where shipmasters' salaries are at a minimum—in the smaller class of steamships—it does not seem to be anybody's business to keep the ship supplied with charts of sufficiently open scale and corrected till the last possible moment before sailing. The steamer *Deptford* was lost off Las Palmas, on May 2nd, almost immediately after leaving port; a Court of Enquiry was held at Las Palmas; and, on arrival home, the shipmaster was called upon to answer a charge of causing, by his wrongful act or default, the loss of the *Deptford*. According to the evidence for the defence at Bow Street, it would appear that the shipmaster concerned attempted to navigate by the aid of a small-scale Admiralty chart, which did not show the rock which happened, as the sorry sequel showed, to lie right in the track upon which the *Deptford* was steered. Admitting the truth of this argument—and the magistrate, in ordering the shipmaster's discharge, was altogether in his favour—it does seem most objectionable that so many good ships are spoiled for a few halfpennyworths of charts. Take the case of the Middlesbrough steamer *Winnie*, stranded while on the passage from Barry to Kilindini, concerning which the finding of the Court has just reached this country from Zanzibar. In the opinion of the Court, this vessel was not provided with proper charts for the voyage for which she was engaged. Assuming the Court to be quite within the boundaries of accurate deduction from the evidence laid before the members thereof, they could only come to the conclusion that the master was guilty of a wrongful act in attempting to make a port at night on a coast with which he was unacquainted. Worse still, although he had charts unfit to serve as safe guides, proper soundings were not taken when approaching the land. Really, there seems to be a lot of luck in navigation at times. Nothing is easier than to be wise after the event, is a proposition not likely to be denied; yet we would submit that any shipmaster who proceeds to sea for a part of the world of which he is ignorant, without having first of all obtained the absolutely necessary charts, is not justified in believing that he is infallible. It is to be feared, though, that quite a number of shipmasters on small salaries accept responsibilities of a very grave nature with a lightness of heart little to be commended.

If the shipowner does not undertake to provide the charts, just as he does the anchors or the compasses, then the master shirks his duty who willingly goes to sea unprovided with these aids to navigation, which are not less essential to safety under certain conditions than either anchors or compasses. He may reach his destination without stranding, but he may not; and then what will the subsequent Court of Enquiry have to say with respect to his dereliction of duty? Even though the nautical assessors engaged in the Enquiry were also among the class who navigate by luck, and not by chart, they would scarcely care to make their failings public. Moreover, the Court in the case of the *Winnie* were strongly of opinion that, in order to justify his mistaking Melindi for Mombassa, the master invented a current which did not exist; and, in order to support this brilliant flight of imagination, he either altered or caused to be altered certain statements, not only in his own work-book, but also in the chief officer's log-book. Taking everything into consideration, if the deductions of the Court are permitted to remain unchallenged, three months' suspension of certificate is quite a small order. We sincerely hope this master will take the necessary steps to show that the Court were in error. A still more recent stranding is deserving of consideration under the head of undue confidence in position by estimation. The Liverpool s.s. *Acara*, Shanghai to New York, *via* Bermuda, stranded on Long Island owing to a serious error of judgment on the part of her master. Making the land, an observation of the Pole Star threw the vessel considerably out of her assumed position, and the master thereupon decided to ignore his star-warning and trust absolutely to dead-reckoning. A fatal error, as the sequel showed; yet, strange to say, almost at the very time, in a series of articles on navigation, appearing in the organ of the Mercantile Marine Service Association, such a preference for dead-reckoning before star observations is seriously recommended, and spoils an otherwise excellent series of practical hints. The Pole Star position proved to be correct, the dead-reckoning egregiously in error. As a result, the master suffers six months' suspension of certificate! Only his frank admittal of error saved him from worse. Incidentally, it is right to mention that the second mate was left in charge of the bridge altogether ignorant of the fact of the land being dead ahead. Shipmasters, or at any rate a section of them, must really awake to their responsibilities.

Names and Addresses of Firms where the Admiralty Charts and Sailing Directions can be obtained.

ADMIRALTY AGENT FOR THE SALE OF CHARTS AND PUBLICATIONS

London	J. D. Potter	145, Minories, E.C.

SUB-AGENTS IN THE UNITED KINGDOM.

Barry	T. L. Ainsley	1, Tip.
,,	Hayes Bros.	Station Road.
Belfast	S. D. Neill	22, Donegal Place.
Blyth	Alder & Co.	Ridley Street.
Bristol	Price & Morse	1 & 2, Broad Quay.
Cardiff	T. J. Williams	63, Bute Street, Docks.
,,	T. L. Ainsley	Primavesi Chambers, James Street.
,,	Wilson & Gillie, Bruce & Son	91, Bute Street.
Cowes (West)	G. H. May & Son	126 & 127, High Street.
,,	Pascall, Atkey & Son	29, High Street.
Dartmouth	Cranford & Son	Library, Fairfax Place.
Dover	C. Clout	135, Snargate Street.
Dublin	Hodges, Figgis & Co., Ltd.	104, Grafton Street.
Falmouth	Williams & Co.	The Quay.
Glasgow	Whyte, Thomson & Co.	96, Hope Street.
,,	Dobbie, McInnes, Ltd.	57, Bothwell Street.
,,	D. McGregor & Co.	57, Bothwell Street.
,,	Kelvin, Bottomley & Baird, Ltd.	16–18, Cambridge Street.
Gosport	Camper & Nicholsons	Yacht Builders.
Greenock	Glendinning & Co.	33, Cathcart Street.
Grimsby	H. A. Johannesen & Co.	Fish Dock Road.
Hartlepool (West)	A. Willings & Co.	73, Church Street.
Harwich	John Groom & Son	Lloyds' Agents.
Hull	Newton Bros. & Holliday	Prince's Dock.
,,	W. Hakes	Commercial Road.
Kingstown (Co. Dublin)	R. Perry & Co., Ltd.	114, Lower George's Road.
Leith	D. Stalker	6 & 8, Commercial Street.
Liverpool	Philip Son & Nephew	45 to 51, South Castle Street.
,,	John Parkes & Sons	11, St. George's Crescent.
,,	Frodsham & Keen	31, South Castle Street.
,,	John Bruce & Sons	25, South Castle Street.
,,	Dobbie, McInnes, Ltd.	39, South Castle Street.
London	E. Stanford	12, 13, 14, Long Acre, W.C.
,,	Imray, Laurie, Norie & Wilson, Ltd.	156, Minories, E.C.
,,	H. Hughes & Son	59, Fenchurch Street, E.C.
,,	Sifton, Praed & Co., Ltd.	67, St. James' Street, S.W.
Maryport	Quintin Moore	Harbour House.
Middlesbrough	Mercantile Stores, Ltd.	Docks.
,,	J. Durkin	Dock Street.
Milford Haven	W. H. Cowley	27, Hamilton Terrace.
Newcastle-on-Tyne	M. S. Dodds	61, Quayside.
,,	S. A. Cail & Sons	29, 31, Quayside.
Newport (Mon.)	E. E. Williams	94, Dock Street.
North Shields	John Lilley & Son, Ltd.	New Quay.
Oban	Hugh Macdonald	"Times" Office, Esplanade.
Plymouth	J. Blowey	23, Southside Street.
Portsea	Griffin & Co.	2, The Hard.
Portsmouth	C. Groom, Ltd.	50, Broad Street.
Queenstown	T. Miller	1, Harbour Row.
South Shields	T. L. Ainsley	Mill Dam.
Southampton	F. Smith & Son	23, Oxford Street.
,,	Frank Moore, Ltd.	90, High Street.
Sunderland	J. J. Wilson & Son	18 & 19, Hudson Road.
,,	T. Reed & Co.	184, High Street West.

SUB-AGENTS ABROAD.

Adelaide (South Australia)	A. E. Sawtell	Divett Street, Port Adelaide.
Amsterdam	L. J. Harri	Prins Hendrikkade, No. 90.
Antwerp	Bayne & Smith	54, Canal des Brasseurs.
Athens	Eleftheroudakis & Barth	Place de la Constitution.
Berlin	D. Reimer	29, Wilhelmstrasse.
Bombay	Lawrence & Mayo	Esplanade.
Bremen	W. Ludolph	6, Tannenstrasse.
Bremerhaven	W. Ludolph	74, Smidstrasse.
Brisbane (Queensland)	Watson, Ferguson & Co.	Queen Street.
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Calcutta	Jas. Murray & Co.	Government Place.
Cape Town	Wm. Mercer & Co.	9, Loop Street.
Constantinople (Galata)	Blair, Campbell & Co.	Oriental Bazaar, Custom House Street.
Gibraltar	Jas. Molinary	Shipchandler, &c.
Hague, The	Van Cleef Brothers	Libraries.
Hamburg	Eckhardt & Messtorf	Steinhöft I.
,,	Thos. Downie	9, Stubbenhuk.
,,	Friederichsen & Co.	Monckebergstrasse, 22.
Havre	L. Croix	15, Rue de Paris.
Hobart (Tasmania)	Walch & Sons	Merchants.
Hong Kong	C. J. Gaupp & Co.	Alexandra Buildings.
,,	George Falconer & Co.	Queen's Road Central.
Lourenco-Marques (Delagoa Bay)	A. W. Bayly & Co.	Booksellers, &c.
Malta	Collector of Customs	Custom House.
Marseille	G. Viallet	8, Rue Beaveau.
Melbourne	J. Donne & Son	300, Post Office Place.
Montreal	Harrison & Co.	53, Metcalf Street.
New York	John Bliss & Co.	128, Front Street.
Newcastle (N.S.W.)	W. H. Sproull & Co.	99, Hunter Street.
Paris	Augustin Challamel	17, Rue Jacob.
Piræus (Greece)	H. C. Decavalla	Shipchandler.
Port Natal	Lewis J. Wilson	The Point.
Port Said	C. J. Vella & Co.	Shipping Agents.
Quebec	T. J. Moore & Co.	105, 120, Mountain Hill.
Rangoon	Lawrence & Mayo	8, Phayre Street.
Rio de Janeiro	D. Norris	28, Rue de Assemblea.
Seattle (Wash.)	Max Kuner	94, Columbia Street.
Shanghai	Walter Dunn	29, Kiangse Road.
,,	Hirsbrunner & Co.	1, Nankin Road.
Singapore	Hon. Sec. and Treasurer	Sailors' Home.
St. John (New Brunswick)	A. B. Smalley & Son	91, Prince William Street.
St. John's (Newfoundland)	Ayre & Son	231, Water Street.
Sydney (N.S.W.)	Turner & Henderson	16 & 18, Hunter Street.
Tokyo (Japan)	Takata & Co.	Merchants.
Toronto (Canada)	Charles Potter	85, Yonge Street.
Trieste	F. H. Schimpff	11, Piazza della Borsa.
Valparaiso	Tyrer, Holbrook & Co.	153, Calle Blanco.
Vancouver (B.C.)	Thomson Sta. Co., Ltd.	325, Hastings Street.
Victoria (B.C.)	Hibben & Co.	66, Government Street.

[*Copy*]

INCORRECT CHARTS.

SPECIAL BOARD OF TRADE OFFICIAL NOTICE TO SHIPOWNERS.

NOTICE TO SHIPOWNERS AND AGENTS.

The attention of the Board of Trade has frequently been called to cases in which British vessels have been endangered or wrecked through Masters attempting to navigate them by means of antiquated or otherwise defective Charts.

The Board of Trade desire, therefore, to direct the especial attention of Shipowners and their Servants and Agents to the necessity of seeing that the Charts taken or sent on board their Ships are corrected down to the time of sailing. Neglect to supply a ship with proper Charts will be brought prominently before the Court of Enquiry in the event of a wreck occurring from that cause.

The Official Catalogue of Charts, plans and sailing directions, published by the Admiralty (issued annually in March), can be obtained free of charge on application to the Chart Agency, 145 Minories, London, E.C., or from any of the sub-agencies at the Home or Foreign Ports.

[*Copy*]

H. 13710.

CIRCULAR 1545.

BOARD OF TRADE,
Harbour Department,
7, Whitehall Gardens,
London, S.W.,
December 1913.

SIR,

The attention of the Board of Trade has recently been called to the great importance, in the interests of shipping generally, of an early intimation being received by the Hydrographic Department of the Admiralty, with a view to the correction of the charts issued by them, of all changes which affect navigation, whether arising from natural causes, or from the construction of harbour works, the laying down or change in position of buoys, the exhibition of lights, &c., &c.

I am therefore desired by the Board of Trade to suggest that you will be so good as to move your Harbour Authority to co-operate with them in the matter by forwarding to them, for transmission to the Hydrographer, an early notification of any such changes as may occur within the Harbour jurisdiction, including the erection of piers and other works, the placing or shifting of buoys and beacons, and the erection of local lights.

The results of any local surveys of harbours, &c., especially of those which show important changes in the depth of water, should also be communicated as soon as possible.

I am, Sir,
Your obedient Servant,
GARNHAM ROPER.

British Admiralty Charts

PUBLISHED BY THE HYDROGRAPHIC DEPARTMENT.

Comparative Statement, showing the number of New British Admiralty Charts Published, Corrections made to the Chart Plates, and Number of Charts Printed, for various years, from 1879 to 1912.

Years.	New Chart Plates Engraved and Published.	Chart Plates Improved by Additional Plans.	Chart Plates Improved by Large Corrections and Additions.	Minor Corrections Made to the Chart Plates.	Minor Corrections at the hands of the Draughtsmen.	Notices to Mariners issued.	Number of Charts Printed for the Royal Navy, Government Departments, and the General Public.
1879	62	20	140	1,880	——	205	192,060
1885	54	32	186	2,750	29,800	243	272,115
1890	76	10	130	4,750	37,270	723	297,120
1895	114	34	163	5,300	30,096	728	312,628
1900	102	30	224	4,520	35,500	874	580,207
1905	110	36	196	5,320	60,499	1392	689,930
1912.	60	42	834	8,259	130,770	1757*	803,580

* Of each of these Notices 4,900 copies are printed off weekly and distributed gratis to the British and Foreign Mercantile Marine Services, Yachting Centres, and the general Shipping public, as well as to H.M. Fleet.

BOOKS OF SAILING DIRECTIONS HAVE BEEN PUBLISHED FOR EVERY SEA.